



AGE SPECIFIC PREVALENCE OF STRABISMUS IN WALK IN POPULATION OF A TERTIARY EYE CARE HOSPITAL IN RAJASTHAN

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ABSTRACT

Background: The study was carried out with the objectives of identifying the prevalence of squint in the walk-in population in a tertiary eye care centre in Jaipur (Rajasthan) and identify the age group that was maximally affected. **Methods:** This study on strabismus was undertaken in the eye OPD of Sahai hospital and research centre, Jaipur over a period of 6 months. 6283 consecutive walk in patients seen in the OPD were screened for this study. The visual acuity was tested by retinoscopy and refraction, followed by ophthalmoscopy and slit lamp examination. Orthoptic screening included the Hirschberg reflex test & alternate cover test. Only those testing positive for these two tests, were further subjected to prism bar cover/ reflex test and binocular single vision assessment. Assessment of both “phorias” and “tropias” was included in the study. **Results:** The prevalence of squint in this hospital's OPD population was found to be 4.23% 23.3% of the patients found to be having squint in this study group belonged to the age group 11-20 years. The age relative prevalence of squint was highest (7.71%) in the under 10 years age group, with a subsequently declining trend. The study found a very significant prevalence of Amblyopia (24.43%) and absence of Binocular single vision (82.81%) in the patients with squint. In the squint patients, there was a slight preponderance of males over females (53.38% versus 46.62%). **Conclusion:** A sizeable number of patients with a significant proportion of paediatric population attending a tertiary level eye care hospital in Rajasthan suffer from squint (astigmatism) about which they may not be aware. Besides refraction, the Hirschberg reflex test and alternate cover test can serve as suitable screening tools for squint in children.

Key Words: Strabismus, Squint

INTRODUCTION

Orthoptic errors contribute significantly to the overall morbidity in our country; however, most of them are grossly overlooked or neglected. It is this relative apathy towards orthoptic errors, which has contributed to a significant squint burden in our

society. Accepting a prevalence of squint being 2-3% in the general population in our country of over 1 billion people, we expect about 20 million cases of squint and a similar stupendous number of cases with amblyopia and loss of stereopsis.

Strabismus affects between 2 to 5% of the preschool population and is an important cause of visual and psychological disability (1, 2). Commonly known as squint, this occurs due to misalignment between the two eyes. This can be manifest in any field of gaze, may be intermittent or constant, and may occur when the child is attempting to fix his gaze at a distant or near object, (3)

Infants are rarely born with their eyes aligned (3). Strabismus and amblyopia are the most common ocular conditions occurring in childhood. Amblyopia is the leading cause of vision loss in childhood. Strabismus is a significant cause of ocular morbidity leading to amblyopia and psychosocial distress in childhood and into adulthood (4).

Stereopsis is the binocular perception of depth (retinal disparity) which facilitates comprehension of complex visual experience. Stereopsis develops in early infancy between about 3 and 5 months of age and depending on the test used, adult levels are not achieved until around 5-7 years.

The development of the fixation reflex is first manifest when the infant is 5-6 weeks old and its constant conditioning gives it characteristics similar to that of an unconditioned reflex by the time the child is 9 years of age (3). However, below this age, cessation of the conditioning process results in its reversal as manifest by amblyopia.

Treatment of strabismic amblyopia by 4 years of age is almost always successful, but the favourable prognosis decreases as the age at which therapy is initiated increases.

The Baltimore Vision Screening Project stated that the prevalence of visual morbidity was 3.9% due to Amblyopia and 3.1% due to strabismus (5). Out of the several causes of strabismus, third nerve palsies in children were frequently found to be congenital (6), lost head trauma is the most common cause of fourth nerve palsy (7), and trauma is the most common cause of an acquired sixth nerve palsy in an otherwise healthy child (8).

Perception of the problem is always the first step required for its systematic correction. In our two-

dimensional ophthalmic practice - of diagnosis and treatment, the third dimension of prevention and screening appears to be highly relevant. This underlines the need for a population-based study to detect the prevalence of squint that can help in proper protocol formulation and policy implementation.

The study was carried out with the objectives of identifying the prevalence of squint in the walk-in population in a tertiary eye care centre, and to assess the age group that was maximally affected so as to create cost effective intervention strategies for the community.

MATERIALS AND METHODS

This hospital-based population cross sectional study on the prevalence of strabismus, was undertaken in eye OPD of Sahai hospital and research centre in Jaipur over 6 months. Institutional ethical clearance was taken before commencing the study. A total of 6283 consecutive walk in patients seen in the OPD from 1st January 2005 to June 30, 2005 were screened for this study.

Inclusion criteria: All the registered OPD walk in patients between 1st January 2005 to 30th June 2005 were included in the study, irrespective of their age, sex, occupation, rural/urban background, educational level or the presenting complaints (latent or manifest squint).

Exclusion criteria: Cases referred to specific specialties e.g. Retina / Glaucoma were excluded as they were assumed to have been pre-evaluated. Charity OPD cases, Camp patients and patients of pseudo squint were also excluded from the study.

The possible precipitating cause like the history of antenatal, post-natal or significant birth events, head injury, systemic disease or family history was also noted for the patients that were screened positive. General physical examination was carried out to rule out any systemic disease or neurological disorder.

Presenting complaints, duration of symptoms and the exact age of onset of symptoms were noted for each study subject. The visual acuity of the patient was tested by performing Retinoscopy and refraction,

followed by direct and indirect ophthalmoscopy and slit lamp examination.

The patients were then subjected to orthoptic screening comprising of Hirschberg Reflex testing (HR) & Alternate Cover Test (ACT). Only those testing positive for squint, based on these two tests, were subjected to Prism Bar Cover / Reflex Test (PBCT / PBRT) and Binocular Single Vision (BSV) assessment. The squint screening protocol sheet was filled up and patient assessed for presence / absence of amblyopia and type of squint. Both “phorias” and “tropias” were included in the study.

Of the surveyed patients, only those whose HR and/or ACT was abnormal were included in the study (screened +ve) group and their relevant details entered into the computer and subjected to statistical analysis.

The above two tests were chosen because any screening tool or method should be quick, easy to perform, and practical for applying to a large population size. Statistical analysis was done by the

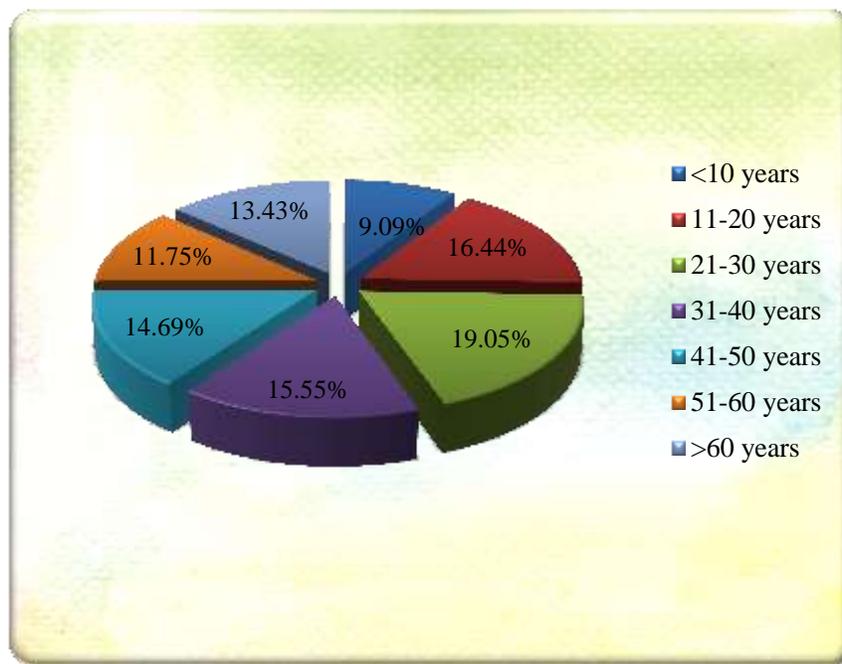
statistical package for social science (SPSS) version 11 programme by a statistician. The following non-parametric tests were used to determine the statistical validation of the study: Wilcoxon-Mann-Whitney rank-sum Location of the Differences , Kruskal-Wallis Test

RESULTS

Patients of all age group were included in the study, the youngest being 8 months and the oldest being 75 years old. The relative distribution of different age groups of the patients is shown in Figure no. 1. The maximum percentage of patients (19.05%) walking into the OPD belonged to 21-30 years age group while those <10 years comprised the smallest age group (9.09%) seen.

266 patients were diagnosed as having squint (either manifest or latent). Thus the prevalence of squint in this hospital's OPD population was found to be 4.23%. The largest number i.e. 62 (23.3% of all squint patients) belonged to the age group of 11-20 years.

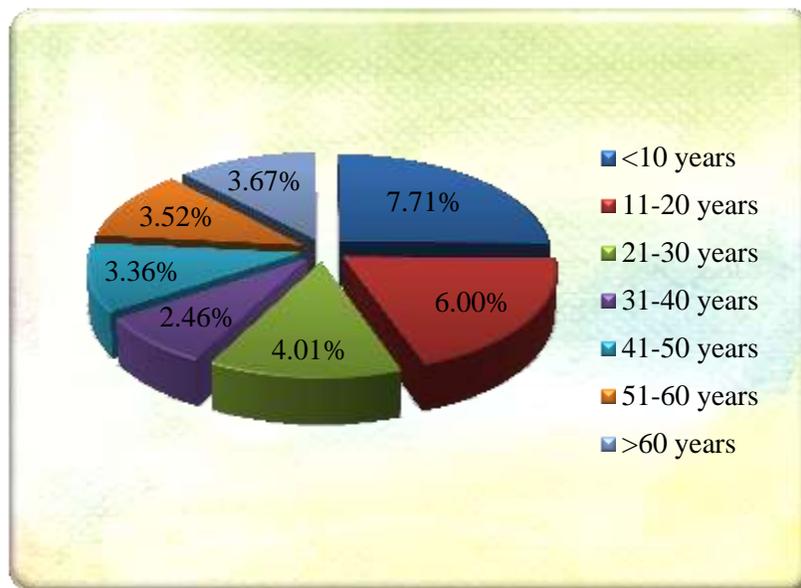
Figure no. 1: Age Profile of Screened Population (n=6283) Out of a total walk in OPD of 6283,



The relative distribution of squint in the patients of different age groups is shown in Figure no. 2. 7.71% of all OPD walk in patients in the <10 years age group were found to be having squint. Thus, prevalence of squint was found to be highest in this age group. The lowest prevalence (2.46%) of squint was seen in the age group of 31-40 years. Within the age group having highest prevalence of squint i.e. under 10 years it was further observed that 68% of these squint patients belonged to the preschool age

group (<6 years) while 32% belonged to the primary school going age group (6-10 age group). The relative ratio of squint among preschool patient population to the school aged population was found to be 2:1. Out of 266 patients of squint, 53.38% were males and 46.62% were females, exhibiting a slight male preponderance. Test for general difference between two distributions is not statistically significant ($p=0.087$). In the 0-10 years and 51-60 years age groups however females outnumbered the males.

Figure no. 2: Prevalence of Squint relative to different age groups



Odds in favour of a higher value in males = 1.474 to 1 with 95% CI (0.518, 4.194).

The commonest presenting complaint of the squint population was decreased vision (49.25%), followed by asthenopic symptoms (30.08%) and deviation of eyes (23.32%).

The study found a very significant prevalence of Amblyopia (24.43%) and absence of Binocular single vision (82.81%) in the patients with squint.

DISCUSSION

Proper sensory motor fusion mechanism is essential for correct alignment of the eyes (6) In the absence of this fusion mechanism, there is deviation of one or both of the visual axes. This condition of manifest

deviation is known as strabismus or squint.

Of the total 6283 OPD patients screened, 266 squint cases were identified with squint. Thus, a squint prevalence of 4.23% was seen in our Eye OPD population. In a study conducted by Grahm et al, out of a population of 339 children, screened on the basis of abnormal cover tests alone, the prevalence was found to be 7.1% (2). Studies around other corners of India during this period have shown the prevalence of squint in the Indian population to be around 3 to 4 % (9). Recently, the prevalence of amblyopia and strabismus was found to be 2.0% and 6.9% respectively at a study conducted in AIIMS, Delhi. (10)

In the present study, most of the screened walk-in

patients belonged to the age group of 21-30 years (19.05%). However, maximum proportion of squint patients belonged to the age group of 11-20 (23.3%). No definite trend was noted in this study; however there appears to be an overall decrease in the prevalence of squint as the age progresses. This may be because children & young adults become aware of their visual and cosmetic problems as they get more exposed to the demands of career and society. This age group is also the most dynamic social segment being active academically, professionally as well as vulnerable to the emotional and social stigma associated with squint (11). Therefore, any screening programme being planned on a community level should not ignore this age group. Corrective measures, especially cosmetic, are also highly sought after and easily accepted in this age group.

Our study shows the highest prevalence of squint (7.71%) in under 10 years age-group as compared to other age groups. In the under 10 age group, children are mainly brought by parents after they notice deviation in their eyes. Also, refractive errors generally do not strain the eyes of a young child under 10 years of age. Corrective measures instituted in this age group will therefore be most gratifying, as far as amblyopia and stereoscopic corrections are concerned. In another study, 22% of the total squint population was found to have a stated onset of squint before the age of 12 Months and 43% in the second and third year. The median age of onset for all squints was 29 months (2). In a recent study at a Government hospital in Vishakhapatnam, children in the age group of 3-10 years of age had the highest prevalence of squint of all the paediatric population screened. (12)

In the present study males and females were found to be affected almost equally being 53.4% and 46.6% respectively. In the Cardiff study (1974), the prevalence was slightly higher for boys than for girls (2). A larger study needs to be done to draw any concrete conclusion.

Though we expect any/all patient with squint to walk into an eye OPD with the main presenting complaint of deviation of eye, this was observed to be true only in the under 10 years age group. This could be due to

the patient being unable to verbalise, the presenting complaint being more of an informant's observation rather than an actual complaint .

CONCLUSION

From this study, we conclude that about 4.23% of the patient population, with a significant proportion of paediatric population attending a tertiary level eye care hospital in Rajasthan suffer from squint (astigmatism) about which they may not be aware. The burden of squint was found to be maximum in the under 10 years age group followed by the 11-20 years age group out of the patients seeking eye-care. Within the less than 10 year age group patients found to be having squint, the prevalence of squint in the preschool aged patients was found to be double of that in the school aged. This suggests early screening for squint should be a part of not just school health checkup programs but also at the Anganwadi level for the pre-schoolers. The study found a very significant prevalence of Amblyopia and absence of Binocular single vision in these patients with squint. Both these conditions are easily correctable and preventable if detected at an early age. We recommend that all tertiary level eye care hospitals should have a dedicated section and staff trained in screening for pediatric squint. Incorporating the Hirschberg reflex test and alternate cover test along with refraction can help in early screening of astigmatism and thus decrease the prevalence of preventable childhood blindness due to amblyopia .

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